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Postal code or zip code	Secure Information
Address	Secure Information
Nationality	KR

Purport

We file an application under Article 42 of Patent Act as above. Agent Geon-Ju Lee (Signature)

Official Fee

Application Fee	20 page(s) 29,000 won.
Additional Application Fee	4 page(s) 4,000 won.
Priority Fee	0 case 0 won.
Examination Fee	0 claim(s) 0 won.
Total	33,000 won.

Attached Documents

1. 1 summary · specification(drawing).

Patent Specification

Abstract

Abstract

The present invention relates to the resources reassigning method of the base station system due to the subscriber capacity gain or the reduction in the CDMA mobile communications system. The present invention is to provide the method for increasing and decreasing the resources relocation of the base station system to the per sector. In this the present invention is the CDMA mobile communications system, it is done by feature as to the base station system resources increasing method to be made of the process of producing ESF, the process where the base station manager transmits ESF with the base station controller, the process where the base station controller transmits ESF received as described above to the base station, the process where the base station loading ESF transmits the ESF loading done message to the base station controller, the process where the base station controller receiving the ESF loading done message transmits the ESF loading done message with the base station manager, the process where the base station manager receiving the ESF loading done message transmits the P·L·D request update signal with the base station controller, the process where the base station controller transmits the P·L·D request update signal to the base station, the process where the base station transmits the P·L·D update complete message P·L·D according to ESF after the update heartburnings with the base station controller, the process of transmitting the P·L·D update complete message with the base station manager after the base station controller updates P·L·D according to ESF, and the process where the base station manager updates P·L·D according to ESF. As to the process of, the base station manager has sector enlargement and reduction information.

Representative Drawing

Drawing 4

Index Term

SECTOR, the increasing hypothesis, and FA,ESF.

Specification

Title of Invention

METHOD FOR INCREASE AND DECREASE SECTOR OF BASESTATION IN CODE DIVISION MULTIPLE ACCESS MOBILECOMMUNICATION SYSTEM{METHOD FOR INCREASE AND DECREASE SECTOR OF BASESTATION IN CODE DIVISION MULTIPLE ACCESS MOBILECOMMUNICATION SYSTEM}

Brief Description of the Drawings

Figure 1 is a drawing showing the state transition diagram according to general base station increase and decrease opinion.

Figure 2a is a drawing showing the sub cell structure of the base station in which the present invention is applied to.

Figure 2b is a drawing showing the sector reduction example according to a preferred embodiment of the present invention.

Figure 3 is a drawing showing the configuration of the code division multiple access system in which the present invention is applied to.

Figure 4 is a drawing showing other process diagram in sector enlargement and reduction according to a preferred embodiment of the present invention.

Figure 5 is a drawing showing the sector increasing method of the base station manager.

Figure 6 is a drawing showing the sector increasing method of the base station and base station controller.

The Detailed Description of Invention

The Purpose of Invention

Field of Invention and the Prior Art

The present invention relates to the present invention is the reassigning method of the base station system due to the subscriber capacity gain or the reduction in the CDMA mobile communications system, particularly, to the sector increasing method of the base station system.

Generally, in the CDMA (Code Division Multiple Access: CDMA) system, in case of to being changed of the system resource because there are countless data depended on the radio environment it affects the geometry system many. Therefore, it makes the new data (PLD) which backups data which the operation middle are and basing on the resources relocation and the existing method for minimizing such affect applies to system. There can be the method increasing FA of the base station system or reducing, and for increasing and reducing the base radio station as the method for relocating the system resource. One base station includes a plurality of FAs. And FA can be comprised of a plurality of sectors. In order to have the same sector of number about all FAs in case of increasing and decreasing the base station it has to increase and has to decrease. In order to have the same sector of number even in case of increasing and decreasing FA it has to increase and has to decrease. The base station and FA enlargement and reduction can be made with the line system coming. This is illustrated with reference to below drawing 1.

Figure 1 is a drawing showing the state transition diagram of the case of increasing and decreasing the resources of the base station system in the general CDMA mobile communications system.

Firstly, base station controller (Base Station Controller: BSC) enlargement and reduction, base station (Base Transceiver Station:BTS) enlargement and reduction, CDMA Channel (FA) enlargement and reduction, TSB enlargement and reduction have to be made in order to increase and decrease the base station and FA with the on-line system.

In fig. 1, the non-builted-in (N Equip) state (105) is the state that does not have to the hardware dependent. It is the state where the state does not have operational data in the PLD (Program Loaded Data). The grow (Grow) state (107) is the state that is mounted but does not perform the direct call service in PLD to the hardware dependent to the increasing system intermediate state. But the loading, the state , and failure and formation management function are the state that it normally performs. In the mounted state (101), data related to the PLD corresponding system is updated. And it is the state updating data in which all CCPs and BCP are commonly used among data related to the radio environment in the neighboring CCP. In the system which the dig low state (103) is with the operation middle, the basic administration is identical with the grow state to the intermediate phase for reduction. In case of reducing the system resource if the DGROW-SYS command is inputted by MMC to the mounted state (101), it transits to the dig low state (103). In the dig low state (103), if the DACT-SYS command is inputted by MMC, it transits to the non mounted state (105) and the system resource is reduced. It transits from again to the mounted state (101) if the ACT command is input. And in case of increasing the system resource if the GROW-SYS command is inputted to MMC to the non mounted state (105), it transits to the grow state (107). In the grow state (107), if it is due to MMC= and if the ACT SYS command is input, it transits to the mounted state (101) and the system resource is increased and the DACT SYS command is input, it transits to the non mounted state (105).

The PLD structure is used system for system resource enlargement and reduction. According to enlargement and reduction, the traditionally employed shape are comprised of the format form of the separate ESF (extension Specification File: extension specification file) and the shape and related data in which the shape have the changed matter are loaded to system. In this way, update data with ESF inputted by one MMC and system can minimize error in data modification according to enlargement and reduction.

In case of PLD is the base station controller and base station increase, the preexistence PLD is copied and the corresponding base station controller and base identifier (Identification: ID) are readjusted among related data. It makes with PLD fitting for the shape of the system which is newly established with reference to the standard PLD.

ESF is the specification file for updating PLD. The hardware shape information about is input. Data to have to be updated from topology data which is input according to the relation are produced. The ESF header and ESF directory are produced as generated related data and relation data are collected and it is generated. Moreover, ESF includes current data. And this is recoverable in the PLD update using ESF in the error generation or enlargement and reduction cancel without the separate task.

ESF is comprised of the ESF header, the ESF directory and ESF related data. The ESF header provides data illustrating ESF including the version (Verson) of the corresponding ESF, kind and Relation number of ESF etc. The kind classified with header is as follows.

ixxyy.(-)sect

It is the i = [a, b, c]. A ESF, ESF , and c which b is applied to BCP are ESF applied to the high position BSC of the expansion system. Applied to the neighboring BSC.

Xx has the value of ID of BSC 00~11. Yy has the value of 00~63 as the BTS ID. And the value sticks to ESF for reduction.

The ESF directory provides the Relation information included in ESF data. Moreover, the ESF directory provides the Grow rel addr and Dact rel addr. The Grow rel addr is data for data recovery in enlargement and reduction and the Dact rel addr has the address which data for data recovery is stored in reduction and enlargement. ESF relation data provides data to update in the real PLD.

In BSM for data application for system enlargement and reduction, MMC is input and if necessary, PLD produces PLD according to the input content. The related ESF is produced. If it is confirmed after data application as the state where the hardware of the reduction state and enlargement is stable, the corresponding system can be activated. If MMC of the operator for activation is inputted, the corresponding system is activated and in order to update enlargement and reduction result in PLD ESF is applied to the neighboring BSC and FA and/or the base station is increased and is decreased.

It divides into a plurality of sector and one FA can use. And a plurality of FAs has to be divided into the same sectors forms the base station. There is a problem that service is discontinued as the method like convention in case of increasing and decreasing sector and it has to increase and has to decrease. Moreover, there is a problem that different number of sector cannot be assigned according to FA.

Technical Problems to be solved by the Invention

Therefore, an object of the present invention is to provide the sector increasing method for increasing and decreasing on ceaselessly of the service in sector enlargement and reduction of the base station system in the CDMA mobile communications system.

It is another object of the present invention to provide the sector increasing method it especially differentiates the sector number without the break of service with FA when standing up at the CDMA mobile communications system with the sector sensitization of the base station system and for increasing and decreasing.

To achieve the above object, in the present invention is the CDMA mobile communications system, it is done by feature as to the base station system resources increasing method to be made of the process of producing ESF, the process where the base station manager transmits ESF with the base station controller, the process where the base station controller transmits ESF received as described above to the base station, the process where the base station loading ESF transmits the ESF loading done message to the base station controller, the process where the base station controller receiving the ESF loading done message transmits the ESF

loading done message with the base station manager, the process where the base station manager receiving the ESF loading done message transmits the P·L·D request update signal with the base station controller, the process where the base station controller transmits the P·L·D request update signal to the base station, the process where the base station transmits the P·L·D update complete message P·L·D according to ESF after the update heartburnings with the base station controller, the process of transmitting the P·L·D update complete message with the base station manager after the base station controller updates P·L·D according to ESF, and the process where the base station manager updates P·L·D according to ESF. As to the process of, the base station manager has sector enlargement and reduction information.

The Structure and Function of the Invention(Device)

The preferred embodiment of below the present invention is circumstantially illustrated with the reference of the attached drawing.

Firstly, the reference numeral was added to the elements of each drawing. Although it was indicated on other drawing, it had the possible same sign the same elements. Moreover, in describing the present invention, in case of being determined because of being gratuitously cloudy, the concrete description to the notification function relating or configuration as to detailed description, omits gist of the present invention.

Figure 2a is a drawing showing the sub cell structure of the base station (BTS) in which the present invention is applied to. The base station is organized of a plurality of FAs. In the drawing 2a, the base station consisting of FA of 8 was shown. In the drawing 2a, one FA is comprised of 6 sector (it says to be "1 sector " less than α:. It says to be "2 sector " less than β :. It says to be "3 sector " less than γ :. It says to be "4 sector " less than δ :. It says to be "5 sector " less than ε :. It says to be "6 sector " less than ζ :). The sub cell (the = sector) of each base station is comprised of the number =8∗ MAX sector number =6 of the per base station MAX FA the drawing 2a of 48 totals.

But the sector number of FA can be changed. Generally, if the number of sector of one FA is changed, it has to comprise identically with the number of the changed sector as described above. But in the present invention, as shown in Figure 2b, it can have other sector number according to FA since increasing and decreasing only the specific sector of the specific FA.

Sector enlargement and reduction is respected to online to do and ESF has to be changed. Firstly, the ESF header section is comprised like next.

ixxyyzzdd.(-)sect

I can have a, b, and the value of c identically with convention. Xx, yy and (-) sect are identical with convention. But in the present invention, zzdd is added. Zz is the CDMA channel index in sector enlargement and reduction. In the drawing 2a, zz has the value of 0~7 since being comprised of FA of 8. Dd has value between the drawing 2adptj 0~5 in sector enlargement and reduction as the sector identifier (Identification: ID).

Moreover, it makes the number of each FA sort sector resourceses ESF different. Therefore, sector, and FA are made in PLD of the BSS system about all datas moving to the key. Moreover, it is applied to data moving to the key only sector. If the present system is illustrated for example, the neighbor list of each base station is used having other value according to the sector of the corresponding base station. However, the division of FA is penuriously used. Since for 1FA, the third sector of 1FA remains in the situation which is 3 sector, 2FA drawing 3 sector in case of reducing the third sector of 2FA, the neighbor leaes of the third sector like that remains. Only this way, the handoff function can be performed about the service of the third sector of 1FA. Only this way, each FA sort sector resources can be used to the gad ?? having other value. Here, if the sector of 1FA is reduced, since altogether being demounted, neighbor list data even in this case, corresponding to the third sector has to be altogether removed the third sector about all FAs. Not only the neighbor list but also other all datas make ESF with the method for being the same. If other one example is more taken, it can look into with data this time, having. Data corresponding to that can give sub cell 11 data. Sub cell data is used especially having other value with each sub cell. That is, data independently used according to the FA sort sector. In this case, data are changed about the sub cell 11 for to approaching through sector enlargement and reduction. In this way, if it does, then it can increase and can decrease independently and it have an effect on service and it perform.

Figure 3 is a drawing showing the base station system of the CDMA communications system in which the present invention is applied to.

If it illustrates with reference to below drawing, denotation 300 referred to is the base station manager (Base Station Manager: BSM). 310 is the base station controller (Base Station Controller: BSC). 320 is the base station (Base Transceiver Subsystem: BTS). The BSM (300) is connected to a plurality of BSCs (310~310n) and the BSC (310) is connected to a plurality of BTSs (320). As to below description, it illustrates for the BSM (300) of respective one, and the BSC (310) and BTS (320).

The BSM (300) is comprised of the shape data management (Configuration Data Management execution: CDMX 301), the system loader part (System Loader execution: SLX 303) and BSM PLD (317) in inside.

The BSC (310) is comprised of the call control process resources handler (CPP Resource Management Execution: VCRMX 315), the call control process system loader part (CPP System Loader Execution: VCSLX 313) and BSC PLD (317). And the BTS (320) is comprised of the transceiver control processor resources handler (BCP Resource Management Execution: VBRMX 325), the transceiver control processor system loader part (BCP System Loader Execution: VBSLX 323) and BTS PLD (327).

Figure 4 is a drawing which is the drawing and shows the sector increasing method of BSM fig. 5 showing the process diagram between the configuration for increasing sector according to the embodiment of the present invention of fig. 2. Figure 6 is a drawing showing the sector increasing method of BTS and BSC.

Referring to figs. 5 and 6, it illustrates with below drawing 4.

If MMC for increasing the sector sensitization is inputted by operator, the CDMX (301) produces PLD according to the MMC input and ESF. At this time, ESF provides the CDMA channel index, of the sector increasing and sector identifier. The CDMX (301) transmits the ESF loading demand signal from 401 step to the call segment processor system loader part (313) if PLD and ESF are generated.

Concretely, in the BSM (300) is 601 step, if MMC is inputted by operator, It progresses as 603 step and it determines whether it is sector enlargement and reduction or not. If it is not sector enlargement and reduction command, MMC progresses as 619 step and general enlargement and reduction operation are performed. The FA identifier it progresses as the BSM (300) silver 605 step if it is sector enlargement and reduction command and for to increasing and to decreasing and ESF having the sector identifier are produced. At this time, ESF makes sector and FA about all datas moving to the key. If one ESF is generated, the BSM (300) inspects all datas progressing as 607 step and move sector and FA to the key whether ESF was made or not. Altogether, if it was made, the BSM (300) transmits the ESF loading demand signal performed in 609 step, that is, 401 step of fig. 4 with the call control process system loader (313) of the BSC (310). Thereafter, in the BSM (300) is 611 step, it inspects whether the loading done message received in 406 step of fig. 4 is received or not. If the loading done message is received among inspection, it produces the PLD request update signal which is the PLD request update signal transmitted to the call control process resources handler (315) of the BSC (310) from 407 step of fig. 4 in 613 step and the BSM (300) transmits. If it is signal-transmitted to the PLD request update, the BSM (300) progresses as 615 step and it inspects whether the PLD update complete message received in 411 step of fig. 4 is received. If it is received, it updates and the progressing BSM PLD is terminated to 617 step according to ESF.

The call control process system loader part (313) of the BSC (310) loads ESF according to the preexistence loading process if the ESF loading demand signal is received. Thereafter, in the call control process system loader part (313) is 403 step, the ESF loading demand signal is transmitted with the transceiver control processor system loader part (323) of the BTS (320). The call control process system loader part (313) transmits the loading done message from 406 step to the CDMX (301) if the loading done message is received from 405 ••• Seo SangGi transceiver control processor system loader part (323) in response to this. The BSC (310) again transmits the PLD request update signal from 408 step to the transceiver control processor resources handler (325) if the PLD request update signal is received to the call control process resources handler (315) in response to the loading done message from the CDMX (301). And then, according to ESF which the BTS (320) is received in 403 step, the BTS PLD (327) is updated. In the BTS (320) after update is 409 step, the PLD update steady signal is transmitted with the call control process resources handler (315). According to ESF which the call control process resources handler (315) receiving the PLD update steady signal is received in 401 step, the BSC PLD (317) is updated. And in 411 step, the PLD update steady signal is transmitted with the CDMX (301).

After updating each PLD, it notifies enlargement and reduction state to block concerned and the BSM (300) , and the BSC (310) and BTS (320) terminate the PLD update in 413 step, 412 step, 410 step.

Referring to Figure 7, if the PLD updating program according to ESF is illustrated in BSC and BTS, the BSC (310) and BTS (320) inspect whether the ESF loading demand signal is received in 701 step from the high position. At this time, datas of PLD which progresses as 703 step if ESF is received and it determines whether it is sector enlargement and reduction and or not it progresses as 705 step if it is sector enlargement and reduction and moves the corresponding FA and sector to the key are updated altogether. But in the determination of 703 step, if it is not sector enlargement and reduction, it progresses as 707 step and general enlargement and reduction operation are performed.

Effect of Invention(Device)

As described above, there can be the advantage controlling each FA sort sector resources through sector enlargement and reduction as online without the break of service of the mobile communications systems. Therefore, it has the advantage improving the reliability of the CDMA system and do efficient and stable.

Scope of Claim(s)

Claim [1]

The sector increasing method of the base station system resources increasing method in the CDMA mobile communications system, wherein it is made of the process of producing the extension specification file, the process where the base station manager transmits the extension specification file with the base station controller, the process where the base station controller transmits the extension specification file received as described above to the base station, the process where the base station loading the extension specification file transmits the extension specification file loading done message to the base station controller, the process where the base station controller receiving the extension specification file loading done message transmits the extension specification file loading done message with the base station manager, the process where the base station manager receiving the extension specification file loading done message transmits the P·L·D request update signal with the base station controller, the process where the base station controller transmits the P·L·D request update signal to the base station, the process where the base station transmits the P·L·D update complete message P·L·D according to the extension specification file after the update heartburnings with the base station controller, the process of transmitting the P·L·D update complete message with the base station manager after the base station controller updates P·L·D according to the extension specification file, and the process where the base station manager updates P·L·D according to the extension specification file, and as to the process of, the base station manager has sector enlargement and reduction information.

Claim [2]

The sector increasing method of claim 1, wherein the extension specification file generating process is made of the step that the MMC input determines sector enlargement and reduction command acknowledge in the MMC input, and the step producing the extension specification file having the FA identifier for to increasing and to decreasing according to MMC, and the step producing the extension specification file having the FA identifier for to increasing and to decreasing according to MMC is inputted if it is sector enlargement and reduction command and relation data for to increasing and to decreasing with the sector identifier.

Claim [3]

The sector increasing method of claim 2, wherein it confronts with all data and moves FA and sector to the key the extension specification file is produced.

Claim [4]

The sector increasing method for the update box to feature operates the corresponding FA and sector to the key if it is the extension specification file according to step, and sector enlargement and reduction of claim 1, wherein the base station controller determines in the extension specification file loading completion whether it is the extension specification file according to sector enlargement and reduction or not.

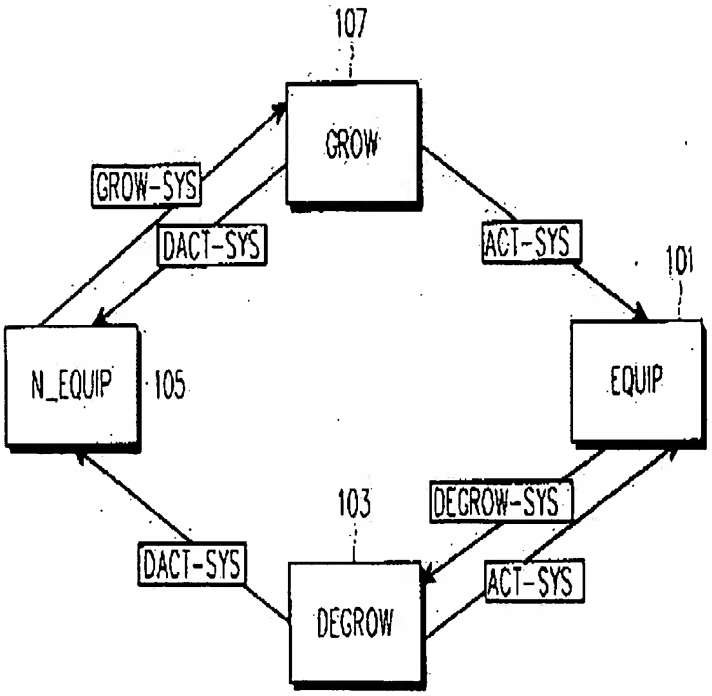
Claim [5]

The sector increasing method for the update box to feature operates the corresponding FA and sector to the key if it is the extension specification file according to step, and sector enlargement and reduction of claim 1, wherein the base station decides in the extension specification file loading completion whether it is the extension specification file according to sector enlargement and reduction or not.

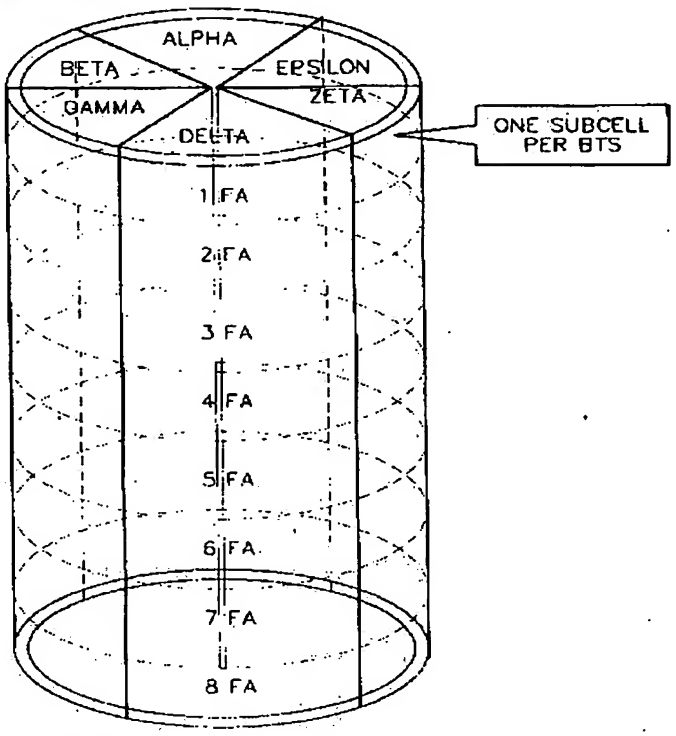
Drawing

Drawing(s)

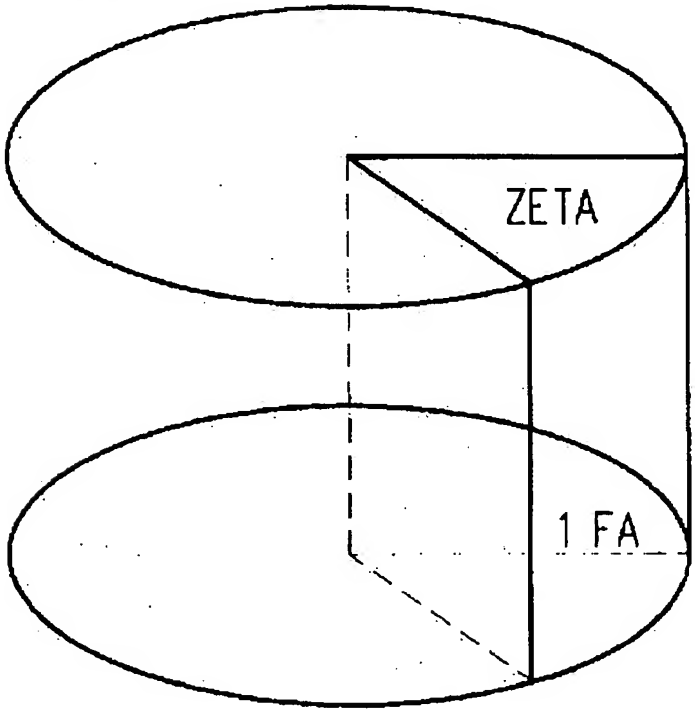
Drawing1



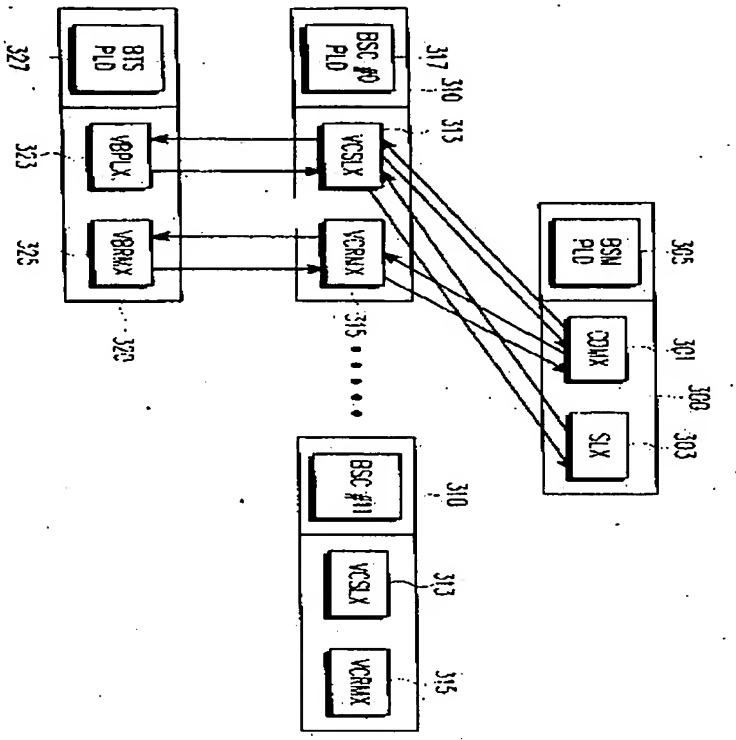
Drawing2a



Drawing2b



Drawing3


BTS PLD
VBPLX
VBRMX
BSC #0 PLD
VCSLX
VCRMX
BSC #11
BSM PLD
CDMX
SLX
327
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317
310
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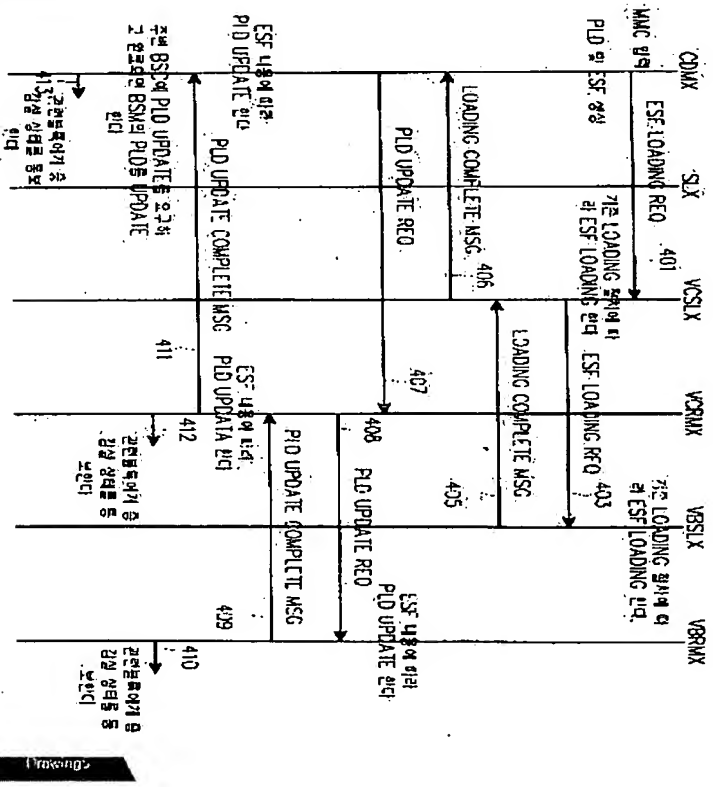
315
305
301
303

Drawing4


CDMX
SLX
VCSLX
VCRMX
VBSLX
VBRMX
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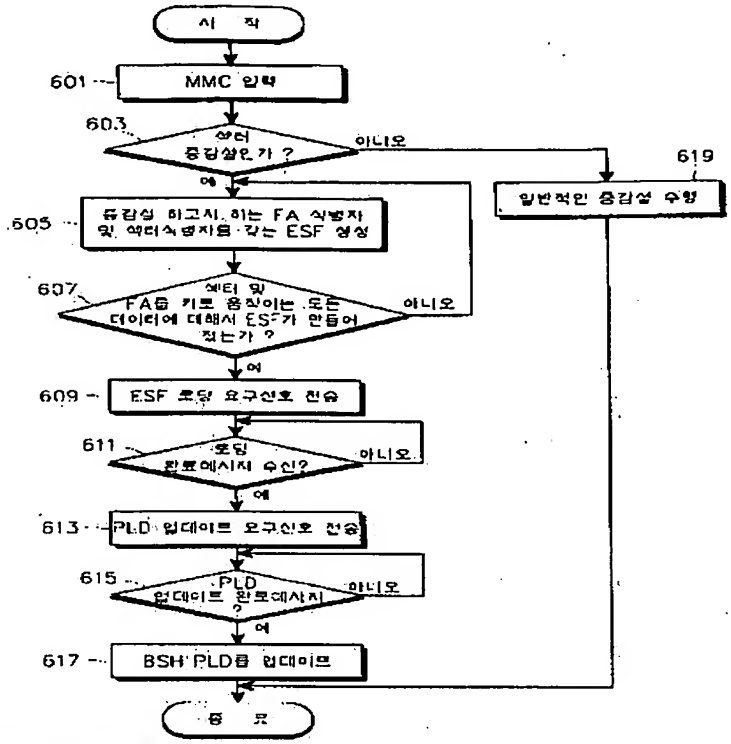
PLD UPDATE REQ
PLD UPDATE COMPLETE MSG
401
403
405
406
407
408
410
411
412
429



Drawings